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LOWENSTEIN SANDLER PC		
65 LIVINGSTON AVENUE		
ROSELAND, NJ 07068		

EXAMINER	
DAO, THUY CHAN	

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/718,400

Applicant(s)

YANAVI, AURA

Examiner

Thuy Dao

Art Unit

2192

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-11 and 13-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-11 and 13-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This action is responsive to the amendment filed on May 1, 2007.
2. Claims 1, 3-11, and 13-21 have been examined.

### **Response to Amendments**

3. Per Applicant's request, claims 1, 3-6, 8, 10, 11, 13-16, 18, and 19-21 have been amended.
4. The 35 USC §101 rejection over claims 1, 3-6, 10-11, 13-16, and 20-21 is withdrawn in view of Applicant's amendments.

### **Response to Arguments**

5. The Applicant is thanked for a thorough reply. Applicants' arguments have been considered but are moot in view of the new grounds of rejection – see paragraphs 12 and 15.

### **Drawings**

6. The drawings are objected to because Fig. 2 contains hand-written text (e.g., reference numbers 202-212).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### **Specification**

7. Applicant is reminded of the proper language and format for an abstract of the disclosure. The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc. (e.g., "*The present invention* ..." in lines 1, 2-3, and 13).

Appropriate correction is required.

### **Claim Rejections – 35 USC §112, 1st paragraph**

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claims 1, 3-11, and 13-21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

**Claims 1, 11, and 21:**

A) Amended claims 1, 11, and 21 recite new limitations *"the absolute total number of software defects"* (emphasis added), which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The Applicant explicitly defined in the title of the application *"Methods and systems for predicting software defects in an upcoming software release"* (emphasis added).

In abstract, the Applicant further set forth *"...provides a novel way to forecast the number of software defects for an upcoming software release..."* (lines 5-6), *"...estimate the number of expected defects ..."* (lines 9), and *"... based on the forecasted number of software defects"* (lines 17), emphasis added.

In specification and figures, the Applicant only disclosed *"Forecast Number of Defects For Release n"* in Fig. 2, step 210, and related text; and displaying *forecasted* number of defects for release 2.0 (emphasis added).

Under the principles of compact prosecution, claims 1, 3-11, and 13-21 have been examined as the Examiner anticipates the claims will be amended to obviate these 35 USC §112, first paragraph rejection. The phrase is considered to read as - - the *[[absolute total]]* number of software defects- -.

B) Amended claims 1, 11, and 21 also recite new limitations *"indigenous software defects"* (emphasis added), which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In the Remarks, page 7, lines 10-14, the Applicant discussed:

*"...In the "defect seeding" method, a number of artificial or "seeded" defects is deliberately inserted into the program to be tested. The number of future "unseeded" or "indigenous"*

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*defects is predicted to be the number of seeded defects planted divided by the number of seeded defects found times the number of indigenous defects found"* (emphasis added).

However, these features and the specific limitation "*indigenous*" are taught by the reference McConnell (page 135, paragraphs 9-12 as recited by the Applicant in Remarks, page 7, lines 5-6), but have not been disclosed by the originally filed disclosure.

Under the principles of compact prosecution, claims 1, 3-11, and 13-21 have been examined as the Examiner anticipates the claims will be amended to obviate these 35 USC §112, first paragraph rejection. The phrase is considered to read as - - [[indigenous]] software defects- -.

**Claims 3-10 and 13-20:**

Claims 3-10 and 13-20 are also rejected based on virtue of their dependency of rejected base claims 1 and 11, respectively.

**Claim Rejections – 35 USC § 103**

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1, 3, 6, 11, 13, 16, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over McConnell (art of record, "Gauging Software Readiness with Defect Tracking") in view of Fenton (art of record, "A Critique of Software Defect Prediction Models").

**Claim 1:**

McConnell discloses a *method for predicting the number of software defects for an upcoming software release, comprising the steps of:*

*determining the relative size of the upcoming software release with respect to a baseline software release (e.g., page 136, paragraphs 3-4, determining relative size of the upcoming software release Version 3.0 with respect to baseline software releases Version 2.0 and 1.0);*

*forecasting the number of software defects for the upcoming software release based on the relative size of the upcoming software release and the number of observed software defects for the baseline software release (e.g., page 136, paragraph 4, Version 3.0 with Version 1.0 and forecasting at least 650 defects in Version 3.0; Version 3.0 with Version 2.0 and forecasting at least 950 defects in Version 3.0);*

*wherein determining the relative size of the upcoming software release with respect to a baseline software release includes the steps of:*

*determining the number of new test requirements for the upcoming software release (e.g., paragraph 4, determining 100,000 new lines of code in upcoming Version 3.0);*

*determining the number of test requirements for the baseline software release (e.g., paragraph 2, in Version 1.0, determining 100,000 lines of code associated with 700 defects; paragraph 3, in Version 2.0, determining 100,000 lines of code associated with 950 defects); and*

*dividing the number of new test requirements for the upcoming software release by the number of test requirements for the baseline software release (e.g.,*

*paragraphs 4 and 16, Version 3.0 with Version 1.0, after dividing said numbers 100,000/100,000 and based on said results, forecasting 700 defects in Version 3.0;*

*paragraphs 4 and 16, Version 3.0 with Version 2.0, after dividing said numbers 100,000/100,000 and based on said results, forecasting 1000 defects in Version 3.0; and*

paragraph 5, Version 3.0 with other 10 baseline projects, after dividing said numbers and based on said results, forecasting 740 defects in Version 3.0); *and*

*displaying the number of software defects for the upcoming software release to a user (e.g., paragraphs 15-16 and 4-5).*

McConnell does not explicitly disclose *displaying the number of software defects for the upcoming software release to a user on a displaying device.*

However, in an analogous art, Fenton further discloses *displaying the number of software defects for the upcoming software release to a user on a displaying device (e.g., FIG 5 with numbers of Defects Introduced, Defects Detected, Residual Defect Count and related text in page 685, section 7.3).*

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the teaching of Fenton into that of McConnell. One would have been motivated to do so to better gauge the likely delivered quality and maintenance effort in software development as suggested by Fenton (e.g., page 675, abstract).

**Claim 3:**

The rejection of claim 1 is incorporated. McConnell also discloses *the forecasting step includes multiplying the number of observed software defects for the baseline software release by the relative size of the upcoming software release (e.g., page 136, paragraphs 2-4).*

**Claim 6:**

The rejection of claim 1 is incorporated. McConnell also discloses *determining a quality measurement for the upcoming software release based on the actual number of software defects for the upcoming software release relative to the forecasted number of software defects for the upcoming software release (e.g., page 135, paragraph 15).*



**Claim 11:**

McConnell discloses *a system for predicting the number of software defects for an upcoming software release, comprising:*

*an input device for obtaining information regarding an upcoming software release and a baseline software release (e.g., paragraphs 3-4 and 7);*

*a processor for determining the relative size of the upcoming software release with respect to a baseline software release and forecasting the number of software defects for the upcoming software release based on the relative size of the upcoming software release and the number of observed software defects for the baseline software release (e.g. paragraphs 4, 8, 10, and 13-14); and*

*displaying the forecasted number of software defects for the upcoming software release to a user (e.g., paragraphs 15-16 and 4-5);*

*wherein the information obtained by the input device includes the number of new test requirements for the upcoming software release (e.g., paragraph 4) and*

*the number of test requirements for the baseline software release (e.g. paragraph 2), and*

*the processor determines the relative size of the upcoming software release by dividing the number of new test requirements for the upcoming software release by the number of test requirements for the baseline software release (e.g. paragraphs 4-5 and 16).*

McConnell does not explicitly disclose *a display device for displaying the forecasted number of software defects for the upcoming software release to a user*

However, in an analogous art, Fenton further discloses *a display device for displaying the forecasted number of software defects for the upcoming software release to a user* (e.g., FIG 5 with numbers of Defects Introduced, Defects Detected, Residual Defect Count and related text in page 685, section 7.3).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the teaching of Fenton into that of McConnell. One would have been motivated to do so to better gauge the likely delivered quality and

maintenance effort in software development as suggested by Fenton (e.g., page 675, abstract).

**Claims 13 and 16:**

Claims 13 and 16 are system versions, which recite the same limitations as those of claims 3 and 6, wherein all claimed limitations have been addressed and/or set forth above. Therefore, as the reference teaches all of the limitations of the above claims, it also teaches all of the limitations of claims 13 and 16.

**Claim 21:**

Claim 21 is a program storage device readable by a machine version, which recites the same limitations as those of claims 1 and 11, wherein all claimed limitations have been addressed and/or set forth above. Therefore, as the reference teaches all of the limitations of the above claims, it also teaches all of the limitations of claim 21.

12. Claims 4-5, 7-8, 14-15, and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over McConnell in view of Fenton and further in view of Yu (art of record, "An Analysis of Several Software Defect Models").

**Claim 4:**

The rejection of claim 1 is incorporated. McConnell also discloses *forecasting step includes multiplying the number of observed software defects for the baseline software release by the sum of the relative size of the upcoming software release* (e.g., page 136, paragraphs 2-4).

McConnell does not explicitly disclose *a regression defect factor*. However, Yu further discloses *a regression defect factor* (e.g., page 1262, paragraph 4).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the above teachings. One would have been motivated to include these factors in the forecasting of defects because taking into account whether features in a previous version are still working properly in a new version will lead to a more accurate defect prediction (page 1262).

**Claim 5:**

The rejection of claim 1 is incorporated. McConnell also discloses *forecasting step includes multiplying the number of observed software defects for the baseline software release by the sum of the relative size of the upcoming software release* (e.g., page 136, paragraphs 2-4).

McConnell does not explicitly disclose *a refactoring factor*. However, Yu further discloses *a refactoring factor* (e.g., page 1262, paragraph 4).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the above teachings. One would have been motivated to do so to as set forth in claim 4 above.

**Claim 7:**

The rejection of claim 6 is incorporated. Yu further discloses *the quality measurement is used by a project management system* (e.g., page 1261, Introduction).

**Claim 8:**

The rejection of claim 1 is incorporated. Yu further discloses *number of software defects for the upcoming software release is used by a project management system* (e.g., page 1261, Introduction).

**Claims 14-15 and 17-18:**

Claims 11-15 and 17-18 are system versions, which recite the same limitations as those of claims 4-5 and 7-8, wherein all claimed limitations have been addressed and/or set forth above. Therefore, as the reference teaches all of the limitations of the above claims, it also teaches all of the limitations of claims 14-15 and 17-18.

13. Claims 9-10 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over McConnell in view of Fenton and further view of Hedstrom (art of record, US Patent 6,477,471).

**Claim 9:**

The rejection of claim 1 is incorporated. Hedstrom further discloses *information used to forecast the software defects is graphically depicted* (e.g. col.4: 11-13).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the above teachings. One would have been motivated to do so because it is crucial for software development that information is presented to the user and for this user to have the ability to access and perform tasks on the different parts of the software as suggested by Hedstrom (e.g., col.2: 19-44).

**Claim 10:**

The rejection of claim 1 is incorporated. Hedstrom further discloses *the baseline software release is selected by a user* (e.g., col.3: 35-47).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the above teachings. One would have been motivated to do so as set forth in claim 9 above.

**Claims 19-20:**

Claims 19-20 are system versions, which recite the same limitations as those of claims 9-10, wherein all claimed limitations have been addressed and/or set forth above. Therefore, as the reference teaches all of the limitations of the above claims, it also teaches all of the limitations of claims 19-20.

14. Claims 1, 11, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over McConnell in view of Hedstrom.

**Claim 1:**

McConnell discloses *a method for predicting the number of software defects for an upcoming software release, comprising the steps of:*

*determining the relative size of the upcoming software release with respect to a baseline software release* (e.g., page 136, paragraphs 3-4, determining

relative size of the upcoming software release Version 3.0 with respect to baseline software releases Version 2.0 and 1.0);

*forecasting the number of software defects for the upcoming software release based on the relative size of the upcoming software release and the number of observed software defects for the baseline software release (e.g., page 136, paragraph 4, Version 3.0 with Version 1.0 and forecasting at least 650 defects in Version 3.0; Version 3.0 with Version 2.0 and forecasting at least 950 defects in Version 3.0);*

*wherein determining the relative size of the upcoming software release with respect to a baseline software release includes the steps of:*

*determining the number of new test requirements for the upcoming software release (e.g., paragraph 4, determining 100,000 new lines of code in upcoming Version 3.0);*

*determining the number of test requirements for the baseline software release (e.g., paragraph 2, in Version 1.0, determining 100,000 lines of code associated with 700 defects; paragraph 3, in Version 2.0, determining 100,000 lines of code associated with 950 defects); and*

*dividing the number of new test requirements for the upcoming software release by the number of test requirements for the baseline software release (e.g.,*

*paragraphs 4 and 16, Version 3.0 with Version 1.0, after dividing said numbers  $100,000/100,000$  and based on said results, forecasting 700 defects in Version 3.0;*

*paragraphs 4 and 16, Version 3.0 with Version 2.0, after dividing said numbers  $100,000/100,000$  and based on said results, forecasting 1000 defects in Version 3.0; and*

*paragraph 5, Version 3.0 with other 10 baseline projects, after dividing said numbers and based on said results, forecasting 740 defects in Version 3.0);*

*displaying the number of software defects for the upcoming software release to a user (e.g., paragraphs 15-16 and 4-5).*

McConnell does not explicitly disclose *displaying the number of software defects for the upcoming software release to a user on a displaying device*.

However, in an analogous art, Hedstrom further discloses *displaying the number of software defects for the upcoming software release to a user on a displaying device* (e.g., FIG. 9A-9H, col.9: 33-36; col.2: 19-29; col.3: 51 – col.4: 4; col.5: 64 – col.6: 14).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the teaching of Hedstrom into that of McConnell. One would have been motivated to do so to provide a method and statistical tool apparatus for predicting defects in products at different stages of development, storing and presenting historical data, and providing prediction of defects as suggested by Hedstrom (e.g., col.2: 19-44).

**Claim 11:**

McConnell discloses *a system for predicting the number of software defects for an upcoming software release, comprising:*

*an input device for obtaining information regarding an upcoming software release and a baseline software release (e.g., paragraphs 3-4 and 7);*

*a processor for determining the relative size of the upcoming software release with respect to a baseline software release and forecasting the number of software defects for the upcoming software release based on the relative size of the upcoming software release and the number of observed software defects for the baseline software release (e.g. paragraphs 4, 8, 10, and 13-14); and*

*displaying the forecasted number of software defects for the upcoming software release to a user (e.g., paragraphs 15-16 and 4-5);*

*wherein the information obtained by the input device includes the number of new test requirements for the upcoming software release (e.g., paragraph 4) and*

*the number of test requirements for the baseline software release (e.g. paragraph 2), and*

*the processor determines the relative size of the upcoming software release by dividing the number of new test requirements for the upcoming software*

*release by the number of test requirements for the baseline software release (e.g. paragraphs 4-5 and 16).*

McConnell does not explicitly disclose *a display device for displaying the forecasted number of software defects for the upcoming software release to a user.*

However, in an analogous art, Hedstrom further discloses *a display device for displaying the forecasted number of software defects for the upcoming software release to a user* (e.g., FIG. 9A-9H, col.9: 33-36; col.2: 19-29; col.3: 51 – col.4: 4; col.5: 64 – col.6: 14).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the teaching of Hedstrom into that of McConnell. One would have been motivated to do so to provide a method and statistical tool apparatus for predicting defects in products at different stages of development, storing and presenting historical data, and providing prediction of defects as suggested by Hedstrom (e.g., col.2: 19-44).

#### **Claim 21:**

Claim 21 is a program storage device readable by a machine version, which recites the same limitations as those of claims 1 and 11, wherein all claimed limitations have been addressed and/or set forth above. Therefore, as the reference teaches all of the limitations of the above claims, it also teaches all of the limitations of claim 21.

#### **Conclusion**

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

16. Any inquiry concerning this communication should be directed to examiner Thuy Dao (Twee), whose telephone is (571) 272 8570. The examiner can normally be reached on the first Monday of the bi-week, and every Tuesday, Thursday, and Friday from 6:00AM to 6:00PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam, can be reached at (571) 272 3695.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273 8300.

Any inquiry of a general nature of relating to the status of this application or proceeding should be directed to the TC 2100 Group receptionist whose telephone number is (571) 272 2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

T. Dao



TUAN DAM  
SUPERVISORY PATENT EXAMINER